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OBSERVATIONS ON THE FUTURE OF
THE WOOL INDUSTRY

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With the thoughts of the peoples of the world turned with hope to a peaceful future after the termination of present hostilities, innumerable plans are being made by all from the rulers of nations to small businessmen for the reconstruction and expansion of countless large and small domestic and international business enterprises. Ours is an era of progress and development. The expansion of basic industries and the creation of new ones in the short span of the last hundred years, has been greater than all previous industrial evolution. Change now follows change in industry with extreme rapidity and under our free competitive system businessmen are forced to follow the general trend of progress or fall by the wayside.

In the United States the wool industry has survived the ups and downs of modern development, somewhat complacently, it has been said. But if this attitude has been shown, it probably has been born of the feeling of assurance that the industry is capable of perpetuating itself because of its basic stability. Yet it would seem that the wool industry will be faced with a period of trial in the future which will be the direct result of textile progress. The war of textile fibers will be upon us with the cessation of hostilities on the battlefields of Europe and Asia.

In this country at present there exists a stockpile of foreign and domestic grease wool which is somewhere between 1,250,000,000 pounds and 1,325,000,000 pounds according to various estimates, none of which are very accurate because the exact amount of wool stored in this country is a military secret. This amount is a two-year supply for normal U.S. consumption. However, by the time the next clip of wool becomes available for use, commencing probably by June 1, 1945, these stocks will have been reduced to between 800,000,000 pounds and 900,000,000 pounds, providing the monthly rate of consumption, which averaged 87 million pounds from January to October, 1944, does not decrease. The 1945 clip will increase the stocks again and we can expect another substantial carry-over to 1946. In the world today there exists a surplus of between 2 and 3 billion pounds of grease wool. Australia has a carry-over equal to one year of production, approximately 1,100,000,000 pounds.

The effect of these surpluses on prices in a normal world market would be disastrous. However, with the possibility of the continuation for several years of existing wool controls, by the American and British Governments, our respective wool producing and manufacturing interests can be protected to a certain extent from the effect of these wartime surpluses.

The next factor which shadows the prospect for wool is the threat of the synthetic fiber industry which has expanded in the last two decades with extreme rapidity. The chief factors in the rapid development of the synthetic fiber trade have been the improvement of the physical characters of the fibers and intensive publicity. In 1884 when rayon, then known as "artificial silk", was patented, it was a weak fiber having deficient fabricating properties. It was produced only as a continuous filament which made it unsuitable for blending with the natural fibers.

But it had luster, and in this one property it simulated the silk fiber. The high price of silk stimulated research to increase the strength and working properties of rayon. These efforts were crowned with such a degree of success that today we have an annual production of this fiber in the United States which is three times as great as the estimated 186,000,000 pounds of clean wool produced in this country in 1944.

Nor is the United States the only country engaged in the production of synthetic fibers: Germany and Japan have shown marked progress in developing their synthetic fiber industries. In 1940 the wool clip of the world was approximately 2,085,000,000 pounds of clean wool--the world production of rayon in that same year was 2,380,800,000 pounds.

TABLE I

Total Amounts of Silk and Rayon Consumed in
the United States, 1929 to 1943

| Year | Silk Pounds | Rayon ¹ Pounds | Rayon Staple Fiber Pounds |
|-----------|----------------|------------------------------|------------------------------|
| 1929..... | 96,848,000 | 133,401,000 | 1,936,000 |
| 1930..... | 80,581,000 | 118,835,000 | 868,000 |
| 1931..... | 87,540,000 | 158,955,000 | 1,595,000 |
| 1932..... | 74,841,000 | 155,331,000 | 3,296,000 |
| 1933..... | 70,361,000 | 217,303,000 | 5,420,000 |
| 1934..... | 60,447,000 | 196,882,000 | 2,111,000 |
| 1935..... | 72,361,000 | 259,017,000 | 6,341,000 |
| 1936..... | 67,541,000 | 322,430,000 | 24,828,000 |
| 1937..... | 64,169,000 | 304,715,000 | 37,641,000 |
| 1938..... | 57,050,000 | 329,390,000 | 55,328,000 |
| 1939..... | 55,271,000 | 458,711,000 | 98,963,000 |
| 1940..... | 47,600,000 | 482,045,000 | 93,316,000 |
| 1941..... | 25,639,000 | 591,717,000 | 139,327,000 |
| 1942..... | --- 2 | 620,624,000 | 151,806,000 |
| 1943..... | --- 2 | 656,066,000 | 161,863,000 |

1--Includes Rayon Staple Fiber.

2--Not Available

Source: U.S. Dept. Of Commerce; Textile Economics Bureau, Inc. (Rayon Organon).

In Table I the amounts of silk and rayon consumed annually in the United States show clearly how silk is rapidly losing its place in the textile world to rayon. Looking back many people will remember how swiftly the rayon invasion came in underwear, dresses and household fabrics of all kinds. The prices of expensive silk garments prohibited their general use among the great mass of the working people of this country who appreciated silk garments just as much as those who could buy them. Rayon textiles found immediate popularity because they were cheap and because they could be made to simulate expensive silk fabrics. At the present time rayon is not only found in the cheaper lines of goods but commands a major share of the more expensive lines of women's dress goods. The introduction of nylon in 1940 dealt silk another stunning blow. Nylon became almost instantly popular and by the end of 1941 the new yarn was being used to make 109 million pairs of women's stockings; prior to this silk was used to make women's hosiery. The fact that we are in a war

period is the only thing that is limiting the distribution of nylon fabrics for public use.

After this war the use of the fiber made by the clever little silk worm will probably be relegated to the class of specialty fibers such as vicuña and alpaca, which enjoy a certain whimsical popularity among a small proportion of the American public.

What is happening to silk may happen in a lesser degree to wool and cotton--in fact, WOOL AND COTTON ARE ALREADY FEELING THE IMPACT OF COMPETITION FROM SYNTHETIC FIBERS. Subtle and deadly is the creeping menace to the wool and cotton industries which are suffering from a certain complacency brought about by long and honorable industrial establishment. The following table, considered to be the best trend index available, illustrates well the decline in use of wool, cotton and silk, and the increase in use of rayon, measured in decades.

TABLE II

ESTIMATED AVERAGE ANNUAL PER CAPITA
CONSUMPTION BY DECADES-UNITED STATES
1929-1942

| Years | Cotton Pounds | Wool Pounds | Silk Pounds | Rayon Pounds | Total Pounds |
|-----------|------------------|----------------|----------------|-----------------|-----------------|
| 1911-1920 | 27.93 | 3.08 | 0.38 | 0.06 | 31.06 |
| 1921-1930 | 26.10 | 3.04 | 0.63 | 0.58 | 30.35 |
| 1931-1940 | 25.20 | 2.62 | 0.51 | 2.23 | 30.56 |

In order to clarify these data the percentage differences between the succeeding decades have been calculated as follows:

| Years | Cotton % | Wool % | Silk % | Rayon % | Total % |
|---|-------------|-----------|-----------|------------|------------|
| 1921 to 1930 Compared with 1911-1920 | - 6.6 | - 1.3 | + 65.8 | + 866.7 | - 2.3 |
| 1931 to 1940 Compared with 1921-1930 | - 3.4 | -13.8 | - 19.0 | + 284.5 | + 0.7 |

One need only study these figures to realize that silk is not the only fiber to suffer from the intrusion of substitutes. Wool has suffered a 13.8% decrease in per capita use in 10 years. Cotton shows a decrease of 3.4%, silk shows a decrease of 19.0% and by elementary deduction it is clear that rayon which INCREASED IN PER CAPITA USE BY 284.5% in the last decade has been responsible for the replacement of these old line textile fibers. Can the wool industry survive in economy if in the present decade there is a comparable decrease in civilian use of wool? The present temporary unstable economic conditions are exempted from this observation.

Other evidence worth considering is the rapid expansion of rayon staple fiber production. From Table I it will be seen that its growth rose from a production of 1,936,000 pounds in 1929 to 161,863,000 pounds in 1943. Rayon staple fiber is merely rayon cut into predetermined lengths and given a dull appearance. It can be

manufactured to the exact fiber diameter necessary and in uniform or varied lengths as desired. In this form rayon threatens wool use because rayon staple fiber can be used by worsted and woolen manufacturers to blend with wool with little change necessary in their manufacturing processes. Prior to the invention of staple fiber, rayon could not be processed in a blend with wool because only continuous filament rayon was produced.

The practice of blending seems to be the chief cause for worry at the present time. Every pound of synthetic fibers used in association with wool in textile fabrics decreases the demand for wool. This is especially significant if we consider that the average per capita consumption of textile fibers in the past three decades has consistently amounted to approximately 30.66 pounds per annum.

It has been pointed out that the increase in public buying power in recent years has resulted in the purchase of more clothes by the public, but it should also be remembered that these clothes have been made of lighter fabrics so that the average per capita consumption of fibers has not increased significantly. This trend in demand for lighter fabrics can be understood when we consider that the developments of heating and air-conditioning in our houses, public buildings and vehicles of transportation have been very great in recent years.

Fabrics made of cotton and mixtures of wool and cotton have always been in competition with pure wool fabrics in apparel use. For this reason some say that synthetic fibers will not invade the wool field further than the cotton fiber has in the past. It should be remembered, however, that synthetic fibers possess certain characteristics and qualifications which are superior to cotton and consequently make them more useful for certain fabrics. An illustration may be cited in the comparatively recent invasion by rayon in the tire cord industry. The present projected capacity of the rayon industry for making tire yarn, is 240,000,000 pounds, of this "one-purpose" fiber. The ability of synthetic fiber manufacturers to change the quality and characters of their product has been of great value in promoting the use of synthetics.

Another fact which should cause concern to the wool industry is that a number of new synthetic fiber manufacturing plants have recently been constructed in this country to fill orders for war materials. These plants will probably continue in production of synthetic fiber textiles after the war emergency period is ended.

As long as the buying power of the American public remains high, textiles made of wool will be in demand, but, if the buying power diminishes and the factor of price again becomes of primary importance to the public, textiles having medium or low prices will be more in demand and will be constructed of wool and synthetic fibers or wholly of synthetic fibers. In the matter of public appeal it was recently proposed that the word synthetic (odious term) should no longer be used to signify man-made fibers. From now on the public will be told about chemical fibers instead.

Wool is an aristocrat in the textile fiber realm, but this domain is becoming increasingly democratic.

Because of the superior resiliency of the wool fiber, a characteristic arising from cellular construction peculiar only to wool and other related animal fibers, and, because of excellent wearing qualities and shape-holding (draping) capacity of wool fabrics, wool so far has not been challenged by any fiber. However, when one considers the improvement of qualities which has continuously been taking place in synthetic fibers for many years, it would be foolish not to contemplate the

possibility that the wool fiber could someday be equaled or even surpassed by some super-synthetic fiber. To say such a thing is impossible is to aver that nature and man are at the peak of their respective developments, whereas the natural phenomena of evolution are in progress around us every day, and man still cannot cure even the common cold or keep his hair from falling out.

In the wool producing end of the industry there are many wool growers who have become increasingly conscious of the uncertain future prospects of wool. There are those who have given up their wool growing enterprises and entered other spheres of agricultural production. The shorn wool clip of 1944 is now estimated to be around 322 million pounds of wool--our lowest production since 1928; we produced 392 million pounds of shorn wool in 1942. Contemplation of the competition between domestic and foreign wool is disquieting to the wool growers; the fact that cloths made of wool blended with synthetic fibers are increasingly used in everyday wearing apparel and are offered for sale at medium and low prices, has shown a significant trend to many in the wool producing business. What will happen to wool economy after the war? What about the threat of the world stockpiles on the wool markets of the United States and other countries? With lower production costs will foreign wool cut our home market from under us in spite of the tariff?

Provided that our international trade in wool and our domestic wool situation continue to be controlled by judicious, far-sighted legislation insofar as is necessary for the maximum benefit to the industry, how can the wool growers of this country plan their operations to insure a sound economic basis for their enterprise? The answer is simply this: No matter what conditions exist, wool growers will have to increase the efficiency of their flocks and management in order to make a living in the wool producing business; in other words, the output per unit of input will have to be increased. This can certainly be done.

In the average flock there exists a difference in shorn fleece weight of from 5 pounds to as high as 14 pounds of grease wool. In terms of clean wool weight this means from $2\frac{1}{2}$ pounds to 5 pounds per fleece. The low producing sheep can be culled out and sold. Such culling is now being practiced on a relatively small number of flocks by wool growers who are receiving assistance in this operation from a number of State agricultural colleges and the U.S. Agricultural Extension Service. Particular attention is given to body size, length of staple, density, uniformity and quality of the fleece. By this means the level of productive efficiency in range and farm flocks can be raised considerably. By culling all the small, inferior, shallow-bodied animals, lamb production is also being increased.

Many wool growers are becoming increasingly conscious of the importance of good blood in their flocks and they are making better selection of breeding stock. This practice is being encouraged but more widespread education is necessary. Wool growers are paying more attention to the suitability of types and breeds of sheep for the particular environmental conditions which exist on their ranges and farms. This discarding of unsuitable types of sheep should receive more attention. In this country we have climatic conditions varying from the dry desert climate with its sparse herbage to the climate of abundant rainfall and lush flora. There exist, or can be developed, types of sheep which will be the ones most suitable for each climatic region between these extremes.

More wool growers' cooperative buying and selling organizations can be formed. The existing cooperative wool-selling organizations have proved of benefit to the wool grower, and further development and expansion of cooperative principles is possible in the future. Wool pools are also beneficial to the wool growers if

properly organized and conducted. With the present trend in business towards amalgamation of small enterprises into single, more efficient buying and distributing units, the producing section of the wool industry can well benefit by such examples. In fact, in all the numerous functions performed in growing wool much can be done to increase their efficiency through the adoption of more scientific methods.

This is particularly true when the preparation of wool for market is considered. The standard of wool preparation in this country is extremely low and has always been totally inadequate for such a valuable product. To pack greasy, wet tags along with white fleeces, to cram all qualities and lengths of wool into the same bag, to pack black wool with white, and to throw heavy-shrinking wool into the wool sack with light-shrinking fleeces, are unsound business practices, to say the least, and are to be deplored. Yet there was a period, from approximately 1911 to 1918, when the American wool grower made an honest effort to prepare his wool in the Australian manner, namely, to separate the qualities and value classes of wool and to bale each separately for sale. This movement failed because of lack of support by the other branches of the wool industry.

Wool Growers have been accused of false-packing their wools. From time to time elaborate collections have been made of pieces of rock, sandpiles, horseshoes, old boots, overalls, dead lambs and many other items of total shrinkage to illustrate the perfidy of the American wool grower. There is no excuse for such practices and when they occur retribution should be severe. However, these cases are few and far between and are not general.

It would be entirely economical and practicable for every wool grower to prepare his wool at shearing time in a manner which would be most acceptable to the manufacturer. It is hoped that such a practice will be promoted in the future. Whether the clip is properly prepared at the shearing pens or in the local warehouse is irrelevant. The grower should have the benefit in the price to be derived from proper preparation.

One thing which has retarded the development of better wool in this country has been the system of buying formerly practiced. In the vast majority of cases the wool grower receives a price for his wool based on an estimate of shrinkage made by a trade expert. That such estimates can vary by as much as 10% from the actual shrinkage, and sometimes even more, is something worthy of consideration. It is the demonstrated tendency for the experts to be drawn towards an average shrinkage rather than differ proportionately on extremes of shrinkage. This human trait is an established psychological phenomenon and is not confined to wool buying alone.

The need for a test for shrinkage of grease wool has long been keenly felt by many wool growers. If the coring test proves as valuable in this respect as present research in the Wool Division of the War Food Administration's Office of Marketing Services strongly indicates, the wool grower will have for his use a scientifically sound, practicable test for ascertaining the absolute shrinkage of his wool. It is anticipated that the use of such a test will encourage the production of better wool in this country, because the wool grower will be able, for the first time in history, to realize the total genuine value of his wool. Heretofore, grease wools have been bought and sold for whatever price the buyer would pay or the seller would sell--not for the value of the actual amount of clean wool which they contained. This fact has been very clearly substantiated by the shrinkage studies performed by the Wool Division in the last two years.

There will never be a more opportune time than the present for representatives of the four branches (producing, handling, top making, manufacturing) of the wool industry to meet and discuss the problems of the present and those of the future which can clearly be seen. At least it would be most advantageous for the wool growers and dealers to talk things over now so that common bases of interest can be established. Great benefits would accrue if simple rules were formulated for preparing grease wools for market in the most acceptable fashion. Grower and dealer collaboration is quite rational and would be economically sound, for, is not the service performed by the wool dealer actually a part of the producing function? The dealer only prepares grease wool for manufacturing by putting it into a more acceptable form. And with original bag wools he does not even do that as such action is unnecessary. He does not process the wool in any way; therefore, his function is definitely a link in production. Wool could be prepared at the point of origin in the fashion most acceptable to the manufacturer who is the actual user, and it might be advantageous for the wool dealer to assist the grower in this step. That correct preparation at the point of origin would mean a substantial saving in cost to the other branches of manufacturing should be considered. The separation of qualities and lengths, the segregation of short wool, stained wool, tags, paint brands, burry wool and all defective wool would decrease the costs of sorting and the eradication of defects in the later stages of manufacturing. The point of origin is the logical place for correct initial preparation of grease wool.

The wool grower, himself a businessman, is only too willing to prepare his wool properly so as to enhance the value of his product, provided he obtains a profit by so doing. But he has never been convinced that he is recompensed for the extra effort necessary for superior wool preparation. Too often, he has taken great care to tie and sack his fleeces properly, pack all the tags separately, and take other necessary steps, but in spite of all his pains he has been offered the same price that his neighbor received for his clip, or even less, although that neighbor made no effort to prepare his wool for market. In part, he is to blame because he does not clearly understand the relative values of different clips, and his knowledge of shrinkage is not extensive. It seems that even the experts can lack precision in estimating shrinkage. In the core shrinkage studies on 92 lots of wool from the 1943 clip the Wool Division found that the expert's errors in shrinkage estimation varied between a maximum overestimate of 9.6% to a maximum underestimate of 10.7%, with an average error of 2.82%.

The old-fashioned buying system practiced in the field is seriously lacking in efficiency. If it was improved so that each wool grower would receive the actual value for his wool, there would be much more progressive wool improvement, and the United States clip would be raised from its present mediocre standard to one at a high level.

In educating the American public to appreciate the value of wool fabrics the instructional and promotional advertising work done by the American Wool Council are highly beneficial to the wool industry. The activities of this agency are financed by voluntary contributions, amounting to 10¢ per bag, made by wool growers. Some of the meat packers, through their interest in pulled wool, have lately been making substantial contributions to the funds of the council. Greater good than is being done at present could be accomplished by expanding this work, but the wool growers and meat packers cannot be expected to carry the entire burden of financing any such enlarged campaigns. The wool growers and industrial interests of the British Commonwealth are probably more conscious of the threat of synthetic fibers to their wool industries than the wool industry of this country is aware of the threat to theirs. Recently, an expanded program of wool research in all fields, from primary production to advertising, has been proposed in Australia to assist

the wool interests of that country. Particular attention is being devoted to the potential intrusion of synthetic fibers. It is also proposed to establish a Wool Consultive Council which would represent all sections of the industry.

In this country, the Wool Products Labeling Act of 1939(S-162), called the Truth-in-Fabric Law, which requires the fiber content labeling of any fabric containing wool, has done much to educate the American consumer in wool appreciation, and to protect him from being sold fabrics composed of inferior substitutes for new wool goods. The law has been so successful in this country that the government of the State of Victoria, Australia, has recently passed legislation that is almost identical. It is understood that the passage of similar legislation is contemplated by governments of other countries in which wool production is of major importance in the national economy.

Much has been said in recent years about discovering and promoting new uses for wool. Unfortunately, the wool industry being long and securely established in our domestic economy, seems to have become rather complacent about its prestige, and has not been of late years as progressive and aggressive as the comparatively young and vigorous synthetic fiber industries. That new uses for wool can be found is evident when we look at the recent development of imitation fur, called Mouton, which has been so successfully developed by processing sheep pelts. It has been predicted that Mouton furs will successfully compete with natural furs in the medium and lower price brackets. The variety of simulations of natural furs and the number of novel effects possible in the Calva process for preparing Mouton indicates that Mouton will become of major importance in the style market. The modifications which can be accomplished with wool on the natural skin are certainly possible in wool fabrics. The wider use of shrink-proofing processes in wool fabrication should be promoted: shrink-proofed wool fabrics would have a greater appeal to the consumer. The same advantage from the selling standpoint applies to moth-proofed wool fabrics.

For solving the problem of production and processing which arise in manufacturing, for experimenting to find new uses for wool, and for investigating the possibilities of imparting new properties to the wool fiber, a national industrial wool research laboratory could be established in this country, with facilities available to all the processing branches of the wool industry. The experimental laboratory and fabricating plant of the British Wool Industries Research Association in England, which has been engaged in researches of this nature, has proved to be of great value to the wool industry of that empire. In the United States there are expert textile scientists whose knowledge and ingenuity would prove of inestimable value to our wool industry if their efforts were integrated and facilitated by the close cooperation possible only in a single organization, whose services would be equally available to all contributing interests.

To declare that the wool industry has now reached the peak of development in wool fiber utilization may cause further efforts for progress to cease and future generations to wonder at the industrial defeatism of our time. Let it not be said, that, for lack of foresight and united effort, our wool industry became an insignificant luxury trade. Grass in the minds of industrialists is more to be dreaded than grass growing on the streets of our cities.

To increase efficiency in production is the only way to meet the competition of synthetic fibers and adverse economic conditions of the future. It seems only reasonable to expect that an increase in productive efficiency by one branch of the industry should be matched by a similar increase in the others, and that such progress in one branch should be given the encouragement it deserves by the other elements of the wool industry.